

EP and WF services in CMA

¹Dr. Dehui Chen, ²Gong Jiandong

³Zhang Yuetang & ⁴Ding Deping

¹Chinese Academy of Meteorological Sciences

²National Meteorological Center

³China Meteorological Administration

⁴Beijing Meteor. Bureau

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Outline

- **1. Current Ensemble Prediction System**
- **2. Services for governmental decision-maker**
- **3. Services for general public**
- **4. Services for specialized sectors**

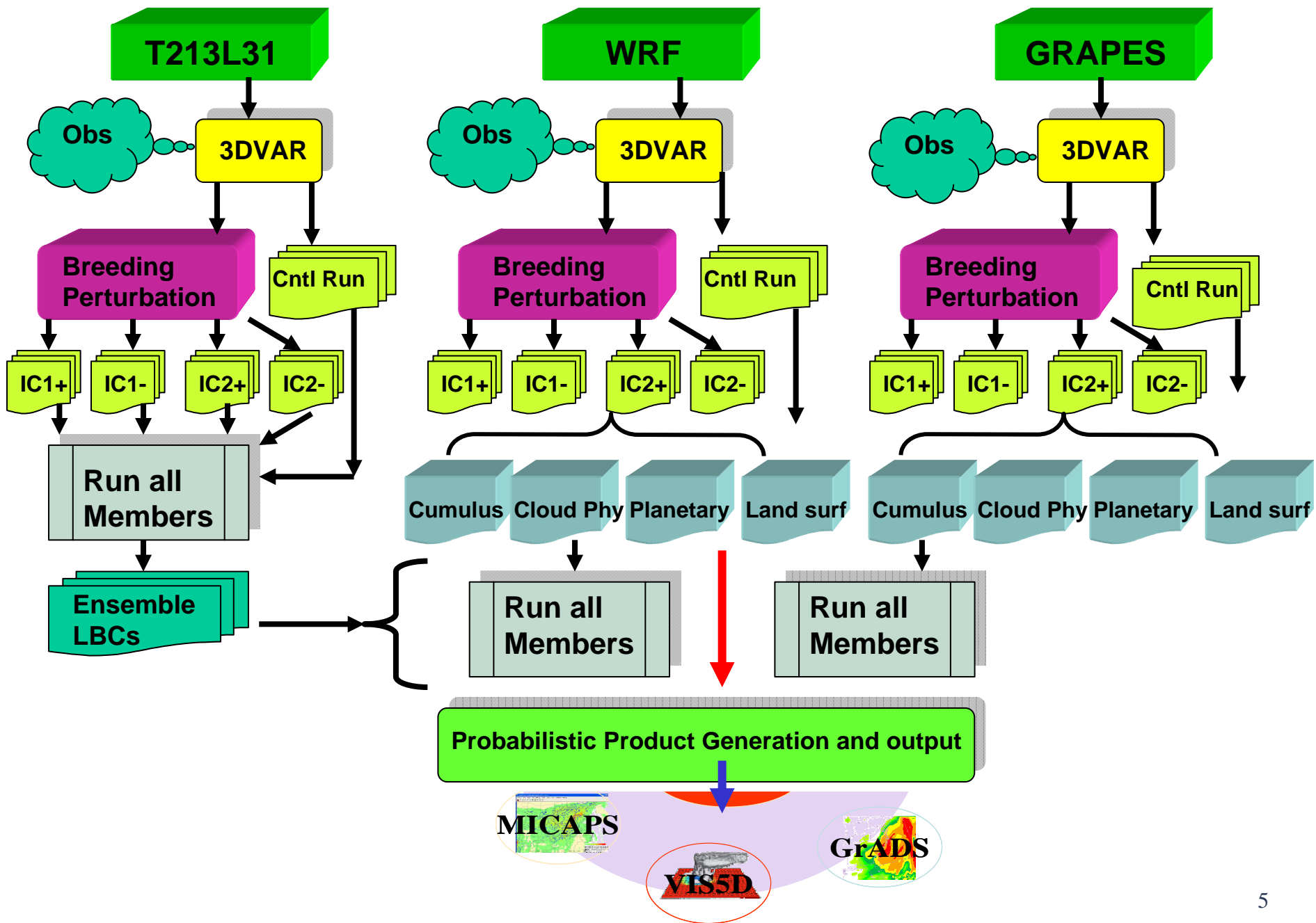


1. Current Ensemble Prediction System

Strategy for EPS development

- **Development of GEPS**
 - G. model (T213L31, operation 2002)
 - Experience (SV's; products; verification)
- **Development of Meso-scale EPS**
 - Directly using global ensemble technique.
 - Testing multi-model & Multi-Physical EPS

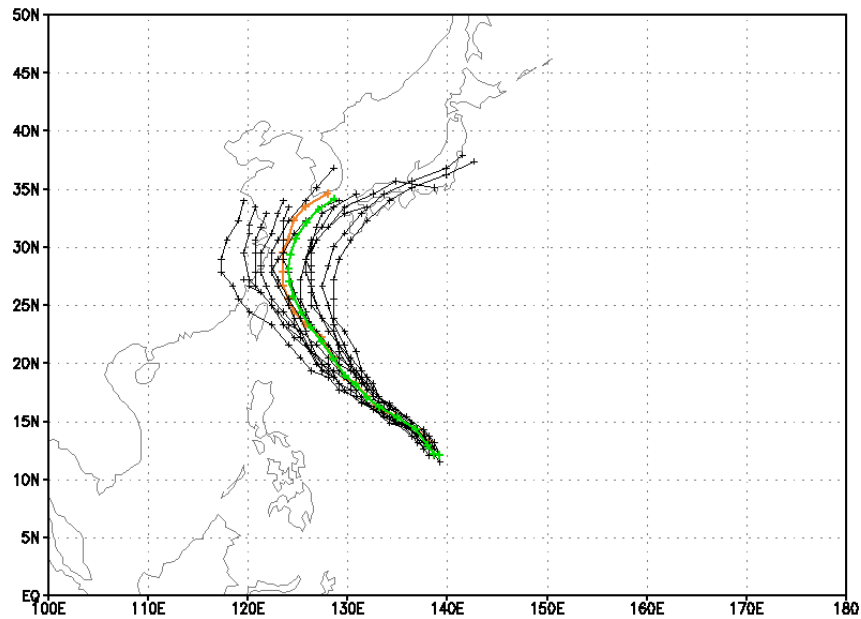
EPS at NMC/CMA



Upgraded operational global EP system

EPS	Operational	Upgraded
Model	T106L19	T213L31
H. resolution	1.125deg Gaussian Grid	0.5625 Reduced Grid
Vertical resolution	19	31
Analysis Scheme	3D OI	3D VAR
Perturbation	SV's	BGM /ET
Target area	Global	Global
Members	33	15
Products	Seldom	Abundance
Verification	Less	More

Tracks from TC-EPS,
120h integration based on 2007070912 UTC
Black:EPS members; Orange:Control; Green:Mean

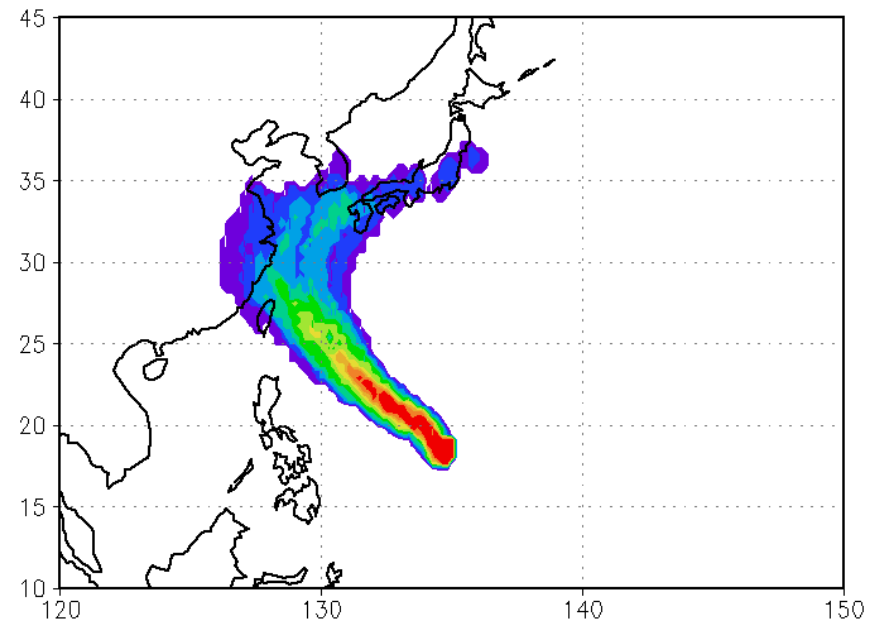


- TC's tracks predicted by G_EPS

- Sea-waves forecasts by a couples A-O model which is under test

Probability that TC(704) will pass within 120km radius

During 120h integration based 2007070912 UTC

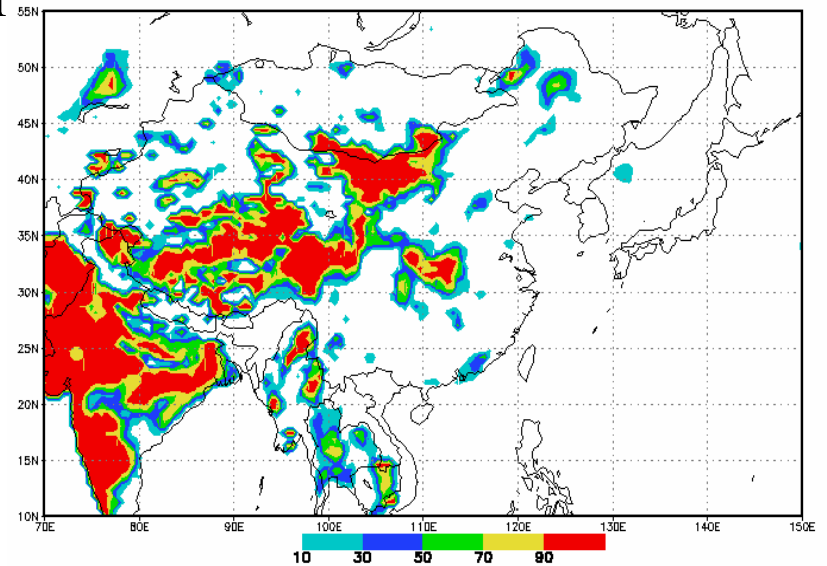


EPS products in CMA

I. Probability

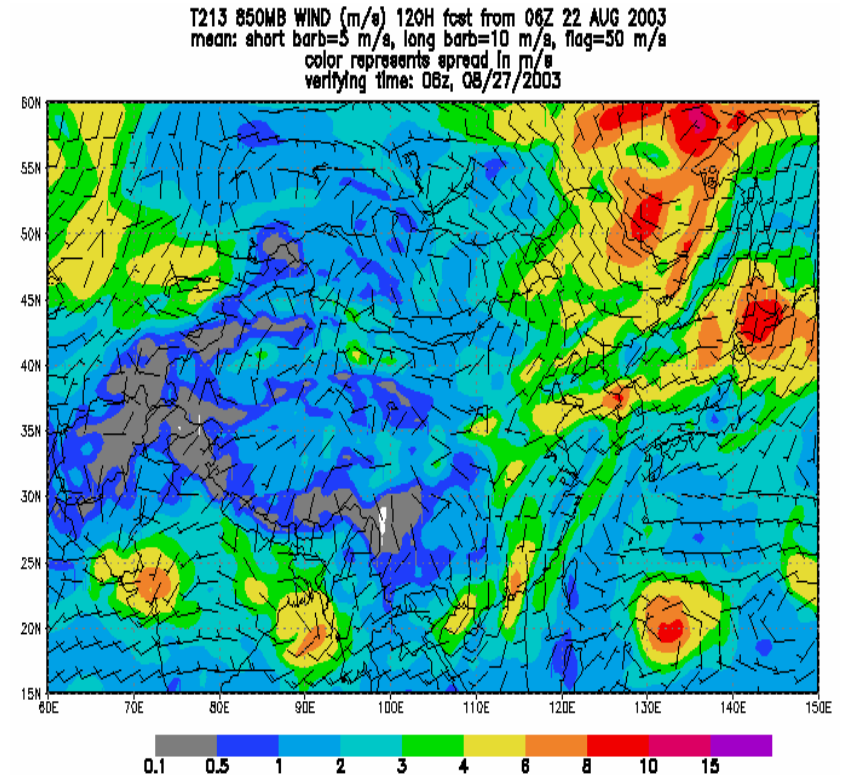
- (a) Accumulated total precipitation (snow quantity is not included)
- (b) Wind speed at 10m
- (c) Max and min temperature at 2m
- (d) Change of forecast temperature
- (e) 850hPa temperature anomaly

EPS-T213 prob of 2m-mnt<=-6C, 12H fcst from 12Z 30 NOV 2006



II. Ensemble Mean and spread

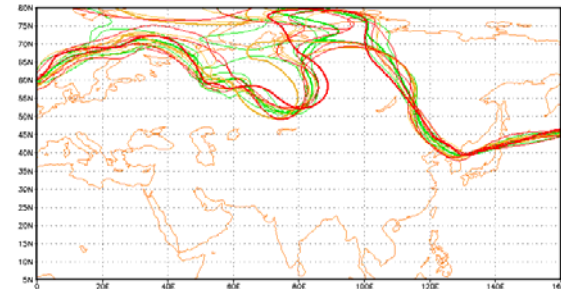
- (a) Accumulated precipitation
- (b) temperature(2m, 850hPa)
- (c) Sea level pressure
- (d) Temperature change (850hPa)
- (e) Sea level pressure change
- (f) wind (850hPa, 700hPa, 500hPa, 200hPa)
- (g) Geopotential height (700hPa, 500hPa, 200hPa)



III. Spaghetti plots

- (a) Geopotential height (500hPa)
- (b) Temperature(850hPa)
- (c) Max/min temperature at 2m

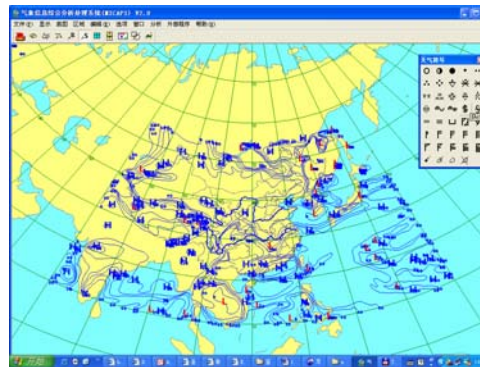
EPS-T213 500mb ht(m) 5280m Spgt 36H fest from 12Z 30 NOV 2006



IV. City site specific graphs: Box & whiskers

- (a) Total cloud cover, total precipitation, 10m wind speed and 2m temperature
- (b) 2m max and min temperature

V. Micaps' Maps



TIGGE-LAM & B08RDP

- B08RDP (Research Development Plan of WWRP for the Beijing Olympic Games) has been recognized as a demonstration plan of TIGGE LAM experiment;
- The coordination should be established between the TIGGE LAM subgroup of the TIGGE/GIFS WG and the Beijing Olympics LAM ensemble activities.

**GIFS-TIGGE 4th Meeting
CMA, Beijing, 21-22 March 2007**

What is B08 Project?

- B08 project was endorsed by WWRP/SSC 7th Session as a five-year (2005-2009) international demonstration project, which is conducted by the China Meteorological Administration to support the meteorological services to Beijing 2008 Olympic Games
- The major components of the B08 project include nowcast and Meso-scale Ensemble Prediction (RDP)





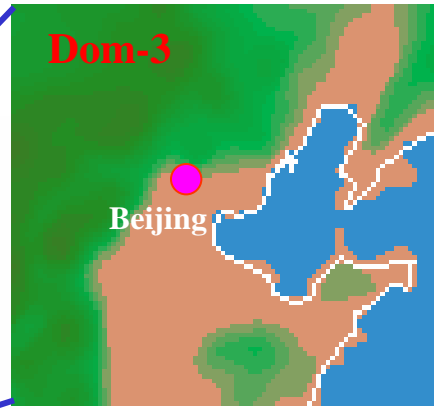
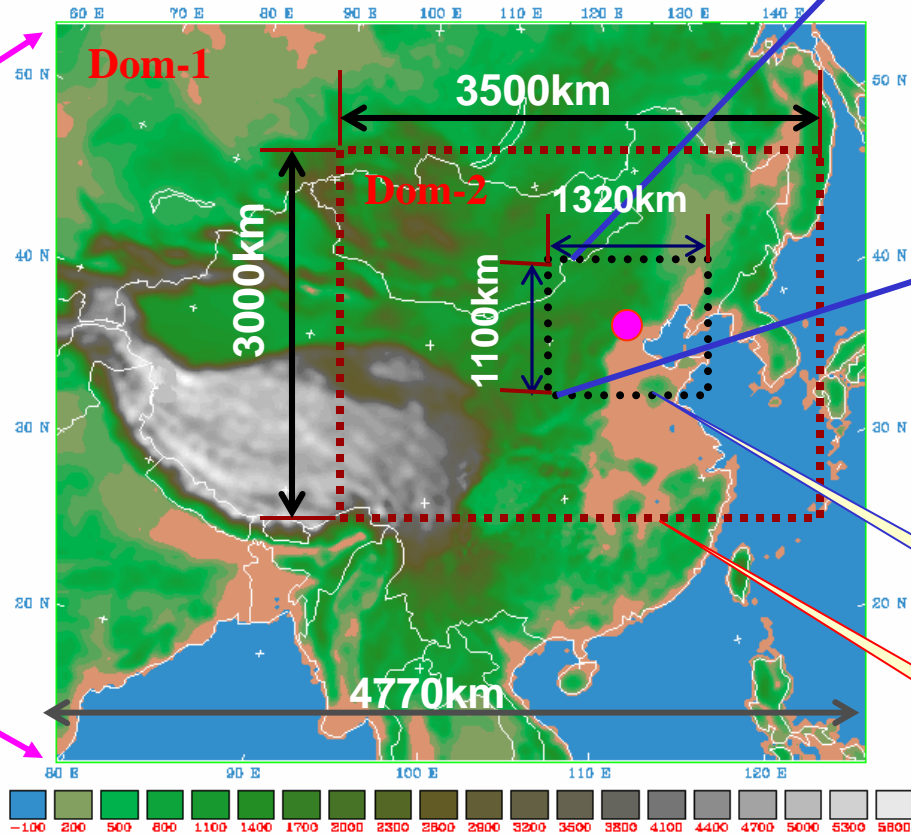
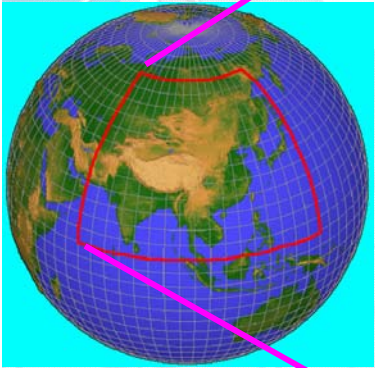
THORPEX INTERACTIVE GRAND GLOBAL ENSEMBLE
LIMITED AREA MODEL

home

Documents

Link to
B08RDP
Webpage

TIGGE-LAM WEB PAGE



Tier 2

Tier 1

Nesting domains for the modeling of B08F/RDP

Participating MEPS systems

- ❑ GRAPES_MEPS(CMA)
- ❑ SREF (NCEP)
- ❑ R_EPS (CMS)
- ❑ Global/meso-scale EPS (JMA)
- ❑ WRF_EPS (NCAR)
- ❑ ARPEGE/ALADIN/AROME (Austrian weather service and Météo-France)
- ❑ RTFV(B. Brown, NCAR)

Participating MEP systems

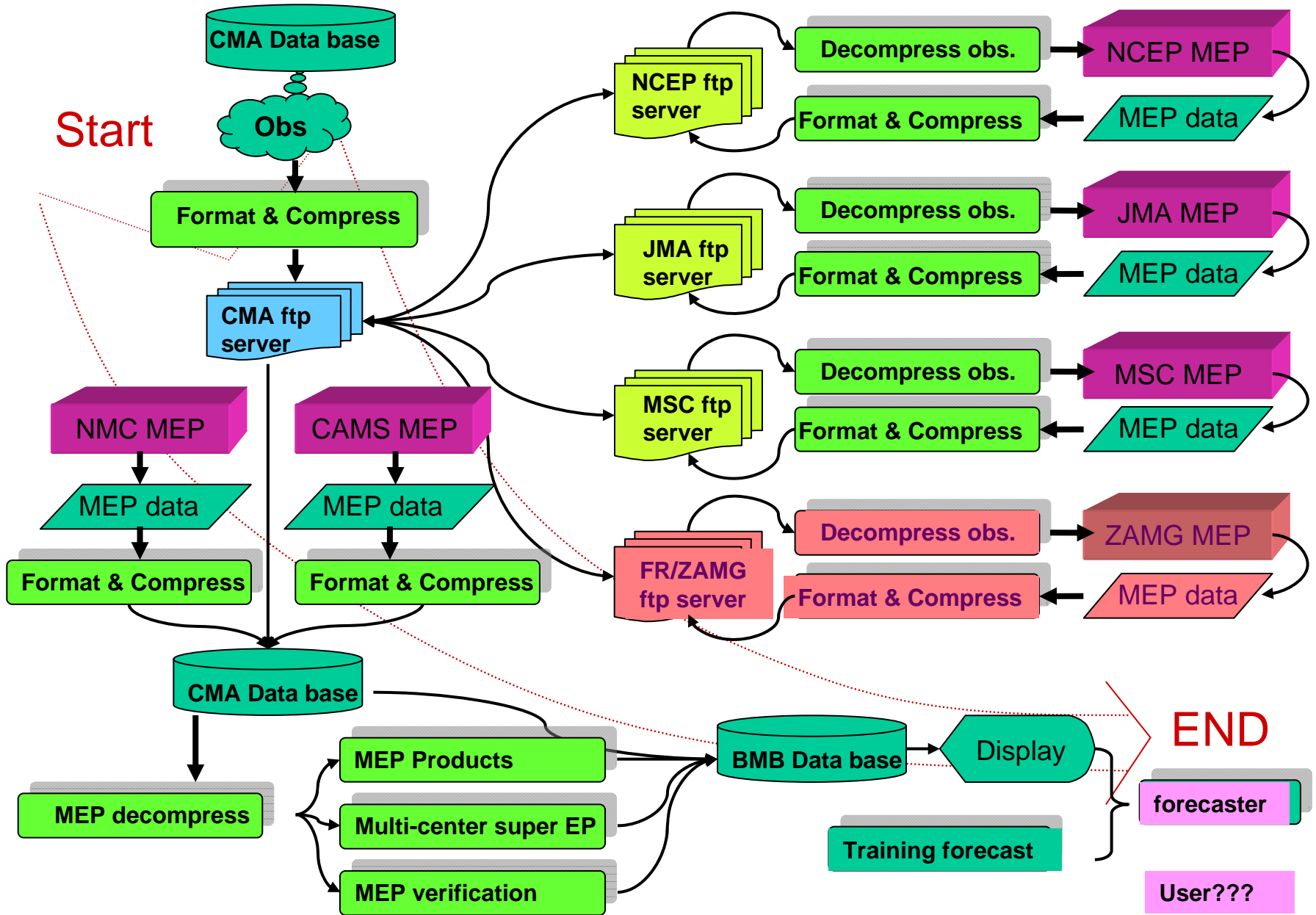
Participants	Model System	Data Assimilation	IC perturbation	LBC perturbation	PHY perturbation	Members
NCEP	WRF-NNM/ARW	3DVAR	BV's 2006 ETKF 2007	NCEP Global- EPS	include	11
JMA	Downscaling JMA-NHM	4DVAR	BV's Normalized More others	JMA Regional- EPS	Not include?	11
MSC	Regional GEM	3DVAR	Moisture SV's 2006	MSC Global-EPS	include	16
FR/ZAMG	ALADIN	3DVAR	BV's, SV's, LETKF	ECMWF Global-EPS	include	11?
CMA/NMC	WRF-ARW	3DVAR	BV's	CMA Global-EPS	include	15
CMA/CAMS	GRAPES-MESO	3DVAR	BV's 2006 SV's/ETKF	CMA Global-EPS	include	11

5 global EPS : CMA, ECMWF, MSC, NCEP, JMA

5 meso-scale Model: WRF, GEM-LAM, GRAPES, JMA-NHM, ALADIN

6 meso-scale EPS:

In real-time



The data flow chart of B08RDP between CMA and participant countries.

Test results for EP products

Center	Ingest data	Ensemble members	Data format	Reference time	Data directory	Daily volume
CAMS	August 8-24	9 (member id: 00-08)	GRIB2	00Z, 12Z	yyyymmddhh	26MBytes
JMA	August 8-24	11 (member id: 01-11)	GRIB2	12Z	yyyymmddhh yyyymmddhh _2 yyyymmddhh _3	17-54MBytes
MSC	August 8-24	16 (member id: 01-16)	GRIB	12Z	yyyymmddhh	33MBytes
NCEP	August 8-22	10 (member id: 01-10)	GRIB2	12Z	yyyymmddhh	12MBytes
NMC, CHINA	August 8-30	15 (member id: 01-15)	GRIB2	00Z, 12Z	yyyymmdd	47MBytes

Key Issues: B08RDP Products

- **Products categories**

2m temperature: **Spread and Mean, >35 >38 probability**

2m relative humidity **Spread and Mean**

10m U,V wind **Spread and Mean**

500hPa Geopotential Height **Spread and Mean**

250, 850hPa U,V wind **Spread and Mean**

250, 500, 850hPa Temperature **Spread and Mean**

850hPa Relative Humidity **Spread and Mean**

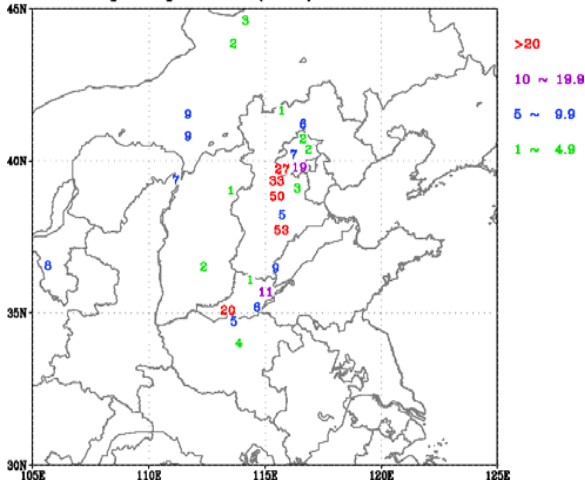
Sea Level Pressure **Spread and Mean**

3 hour Precipitation **1, 5, 15, 25, 50mm probability**

Products at particular stations: **Beijing(17) and Qingdao(4)**

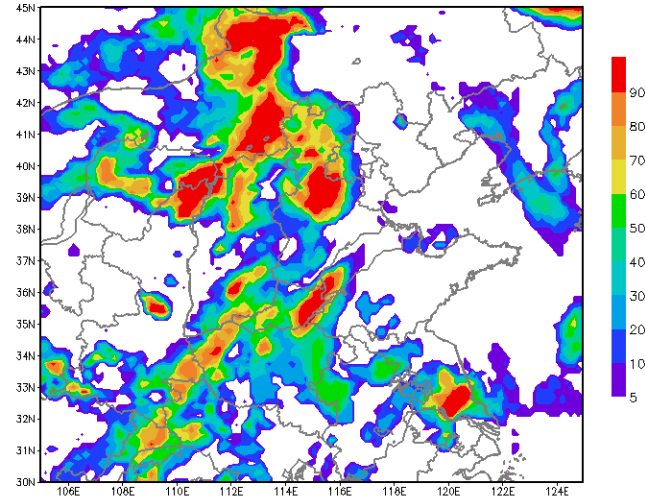
CAPE, CIN, SAUNA Index

3-hour precipitation (mm) at 15Z30JUL2007



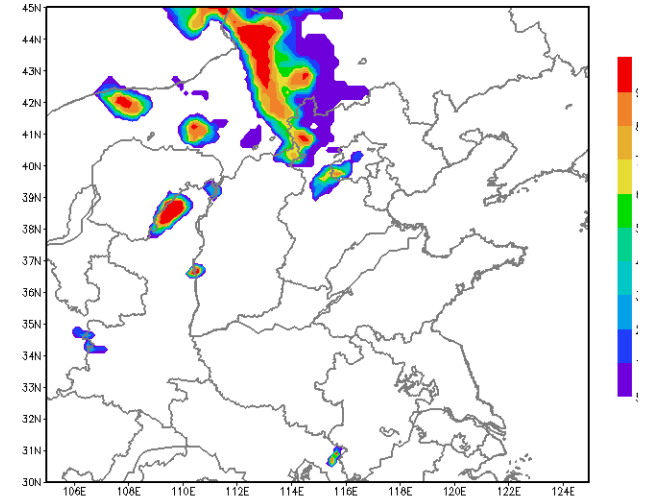
Rainfall
observation

Prob of 3hr precip ≥ 1.0 mm in 3H fcst from 2007073012
NMC



CMA/NMC

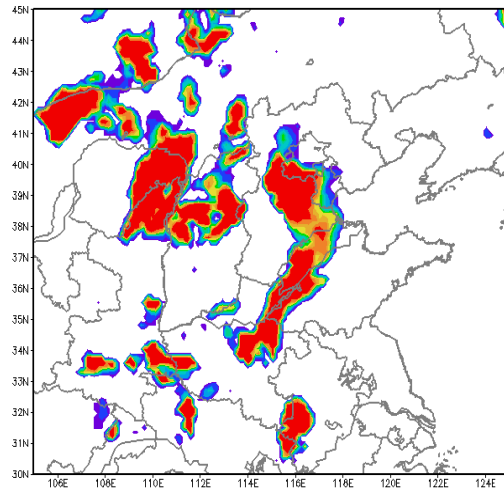
Prob of 3hr precip ≥ 1.0 mm in 3H fcst from 2007073012
JMA



JMA/MRI

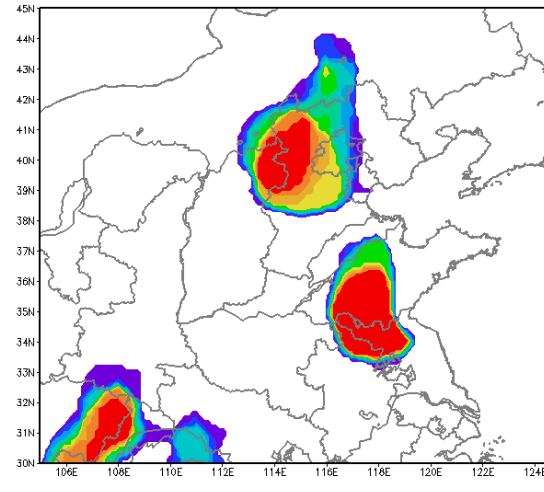
More Products see <http://www.b08rdp.org>

Prob of 3hr precip ≥ 1.0 mm in 3H fcst from 2007073012
MSC



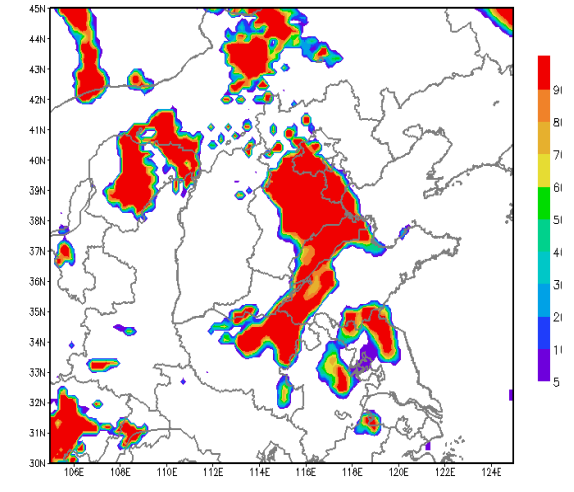
EC

Prob of 3hr precip ≥ 1.0 mm in 3H fcst from 2007073012
NCEP



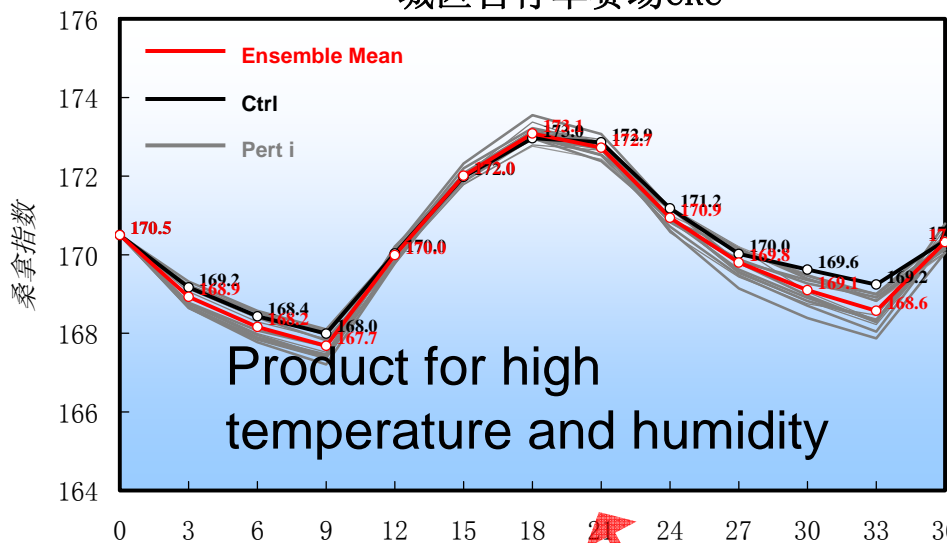
NCEP

Prob of 3hr precip ≥ 1.0 mm in 3H fcst from 2007073012
ZAMG

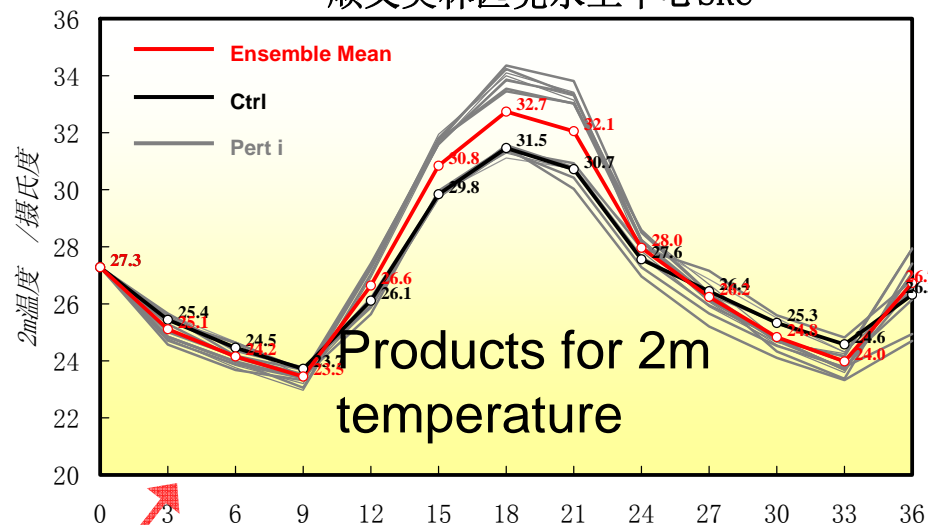


ZAMG/FR

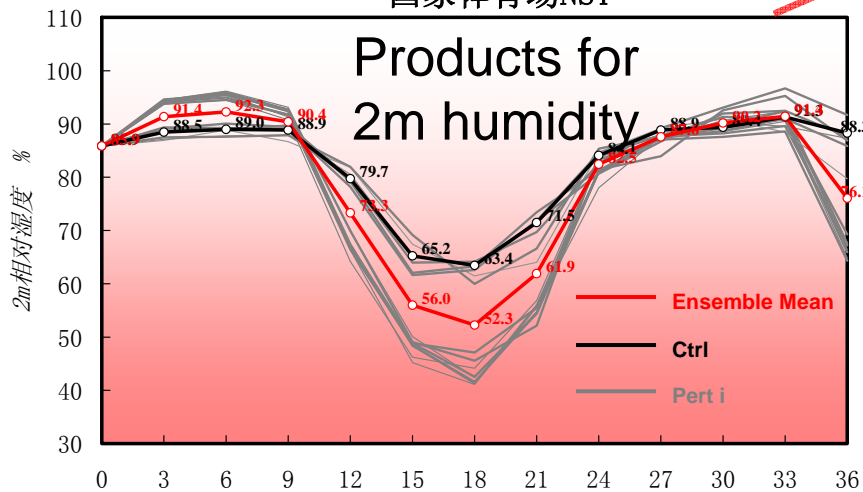
城区自行车赛场CRC



顺义奥林匹克水上中心SRC



国家体育场NST



昌平
海

顺义

朝阳

通县

兴

Provide Beijing
17 venues 1-3
hour forecast
products



The 2nd workshop of B08FDP/RDP was held from 30th Aug. to 1st Sept., 2006 in Beijing-China;

The 3rd workshop of B08FDP/RDP was held from 20th to 23rd Sept., 2007 in Beijing-China;

Seasonal Prediction

- An experimental multi-centers-models EPS has been established between CMA, JMA and KMA for seasonal prediction
- Every year, in March, we have a multi-national centers discussion meeting for the summer-season predictions, using the multi-models EPS products.



2. Services for governmental decision-maker

2. Services for governmental decision-maker

- Meteor. bureaus closely work with the governments at different levels (from national, provincial, to regional levels) for providing the important weather reports:

天气公报

重要天气公报

第 88 期

中国气象局中央气象台 2006.09.10 19:00

华北东北地区将出现风雨和降温天气

来自西伯利亚的一股冷空气今天上午其前锋已到达我国新疆北部地区，预计这股冷空气将继续向东移动，未来三四天，自西向东先后影响我国新疆北部、西北地区东部、华北大部、东北地区等地，上述大部地区将先后出现 4~4 级偏北风或偏南风，局部地区的阵风可达 7 级；冷空气前锋过后上述地区的气温将下降 4~8℃，局地可达 10~14℃。

21~22 日，受温带气旋影响，内蒙古东部偏南地区、河北北部、吉林南部、辽宁、黄淮中东部、江淮大部等地有中雨，其中内蒙古东南部、辽宁等地局部地区有大雨或暴雨，渤海、黄海中西部有 4~5 级、阵风 9 级大风。另外，四川盆地、重庆、陕西南部、湖北西部、湖南西北部、贵州北部等地也将有中雨，局部地区有大雨。

明天早晨，河北南部、山西南部、陕西中部、江西东北部等地的部分地区有能见度低于 1000 米的雾，局部地区的能见度低于 500 米。

中国气象局中央气象台

2002 年 5 月 17 日下午

地区
多阵雨雷阵雨天气

，未来三四天，新疆大
东北地区自西向东将有

新闻通稿

(第 06-207 期)

中央气象台 2006 年 10 月 16 日 11 时

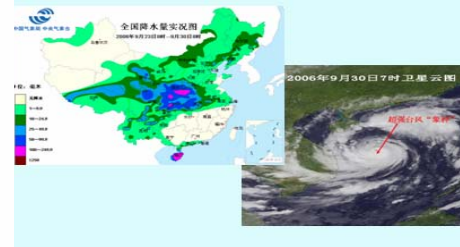


区持续出现雾

我国大雾频繁发生的时节，近一周以来，华北平原大部、江淮、地区东部、江南以及华南大部地区早晨均出现了雾，其中湖南、东、安徽、河南、河北等地局部地区出现了能见度小于 500 米的雾。雾对交通、航运和人们健康会造成不利影响，但雾区在上午 8 时以后计划明后天早晨，华北平原南部、汉水流域、江淮、江南中东部有雾，局部地区有大雾。

原因是：(1) 我国东部近期低层盛行偏东或偏南气流，这种气形成的物质条件；(2) 最近无明显冷空气影响我国大部地区，较为稳定，空气透明度好，利于辐射降温，导致近地层气温较凝结成雾形成辐射雾。

- 9 月下旬，热带系统较活跃，其中第 15 号热带风暴和第 16 号超强台风“象神”影响我国华南及南部海区。旬前期，受弱冷空气影响，我国北方大部地区出现降水天气；28~30 日，受冷空气影响，西南地区东南部、汉水流域等地出现次强降水天气。
- 第 14 号超强台风“摩罗”对我国近海没有影响
 - 第 15 号热带风暴影响我国海南
 - 第 16 号超强台风“象神”影响我国华南及南部海区
 - 北方地区出现一次强降水过程
 - 西北地区东南部汉水流域等地出现强降水天气



重大气象信息专报

第 124 期

中国气象局 2006 年 7 月 14 日

“碧利斯”即将在福建福清到霞浦一带沿海登陆，登陆后影响时间长，降雨量大，需防强降水引起的山洪灾害。

摘要：强热带风暴“碧利斯”今日 8 时位于福建省连江东南方大约 130 公里的海面上，中心附近最大风力有 11 级，预计：强风暴中心将向西北方向移动，即将于今天中午到晚上在福建福清到霞浦一带沿海登陆，强热带风暴登陆后，维持时间较长，降雨量大，要注意防御由强降水引起的山洪、山地以及城乡积涝等灾害。





































3. Services for general public

3. Services for general public

- WFs are delivered to the general public via radio, television, internet, news papers, mobile phone, ... so on.

Time ahead	Weather Events	Method
Weather monitoring	S. & Ext. weather	RT Obs. and climate analysis
Nowcasting (0 – 3 h)	SW and related disasters	Extrapolation + super-HR. meso-scale modeling
Very short time (3–12 h)	SW & related disasters, and U, V, T, RH	HR. meso-scale modeling and dyn. diagnostics
Short term (12-72h)	QPF, SW, U,V, T, RH	NWP, EPS, forecasters' experiences
Medium rang (4D-10D)	QPF, U, V, T, main weather process	NWP, EPS, forecasters' experiences
Extended rang (10D-30D)	Main weather process, tendency	NWP, EPS, forecasters' experiences, dyn. statistics

Warning categories for S.W.

T.C.				
H.R.				
H.T.				
C.B.				
H.F.				
H.R./S.W.				
S.W.				
S. D. S.				
Hail S.				
Th.S.				
F.R.				

Note: TC- tropical cyclone, HR-heavy rain, HT-high temperature, CB-cold breaking, HF-heavy fogs, SW-strong wind, SDS-sand/dust storm, Hail S.-hail storm, Th.S.-thunder storm, FR-freezing road.

Meteor. services for life at BMB

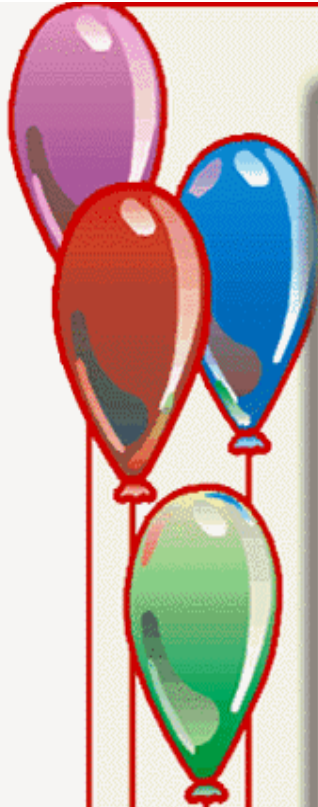
- Since 1997, the meteor. services for life has been provided at BMB to the general public.
- There have been 10 categories and 60 types of index in term of meteor. services for life

- W. & fitness
- W. & health
- **W. & studying**
- **W. & working.**
- W. & tourism
- W. & traffic
- **W. & living**
- **W. & gourmand**
- W. & wearing
- W. & environ.

Weather index information

请选择下列各项

- 基本气象信息
- 天气预报信息
- 实时气象信息
- 气象指数信息
- 城市气象信息
- 人工影响天气
- 农业气象信息



Spring

AQ 空气污染条件
 ME 晨练指数
 EC 晒衣指数
 CO 舒适度指数
 SU 晒太阳指数
 WC 穿衣指数
 CL 登山指数
 MD 医疗气象
 FI 钓鱼指数
 BL 花期预报
 RB 划船指数
 WA 洗车指数
 AN 负离子指数
 DB 啤酒与冷饮

Summer

AQ 空气污染条件
 WI 霉菌指数
 EC 晒衣指数
 CO 舒适度指数
 UV 紫外线指数
 DB 啤酒与冷饮
 CL 登山指数
 SS 中暑指数
 FI 钓鱼指数
 SW 游泳指数
 RB 划船指数
 WA 洗车指数
 AN 负离子指数
 AC 空调开启

Autumn

AQ 空气污染条件
 EN 观赏
 WC 穿衣指数
 CO 舒适度指数
 UV 紫外线指数
 DB 啤酒与冷饮
 CL 登山指数
 SS 花期预报
 FI 钓鱼指数
 SW 游泳指数
 RB 划船指数
 WA 洗车指数
 AN 负离子指数
 WO 高空作业

Winter

AQ 空气污染条件
 ME 晨练指数
 SK 滑冰指数
 CH 风寒指数
 SU 晒太阳指数
 WC 穿衣指数
 CL 登山指数
 MD 医疗气象
 WS 冬泳指数
 CN 商场客流量
 RB 划船指数
 WA 洗车指数
 AN 负离子指数
 CF 水泥冻害

北京气象指数信息源

Explanations of abbreviations

- **In Spring:**
- AQ : Index for Air Quality
- ME : Index for Morning Exercises
- EC : Index for Exposing Clothes to sun
- CO : Index for COMfortability
- SU : Index for SUNshining
- WC : Index for Wearing Clothes
- CL : Index for CLimbing
- MD : Index for MeDecine
- FI : Index for FIshing
- BL : Index for BLOoming
- RB : Index for Rowing Boat
- WA : Index for Washing car
- AN : Index for ANion
- DB : Index for Drinjng Bear
-

Explanations of abbreviations

- **In Summer:**
- AQ : Index for Air Quality
- WI : Index for Wildrewing
- EC : Index for Exposing Clothes to sun
- CO : Index for COMfortability
- UV : Index for UV-radiation
- DB : Index for Drinking Bear
- CL : Index for CLimbing
- SS : Index for SunStroking
- FI : Index for FIshing
- SW : Index for SWimming
- RB : Index for Rowing Boat
- WA : Index for Washing car
- AN : Index for ANion
- AC : Index for Air Conditioning
-

Explanations of abbreviations

- **In Autumn:**
- AQ : Index for QualityAir
- EN : Index for Enjoying the sight of red maple leaves
- WC : Index for Wearing Clothes
- CO : Index for COMfortability
- UV : Index for UV-radiation
- DB : Index for Drinking Bear
- CL : Index for CLimbing
- SS : Index for SunStroking
- FI : Index for FIshing
- SW : Index for SWimming
- RB : Index for Rowing Boat
- WA : Index for Washing car
- AN : Index for ANion
- WO : Index for WORking-high up in the air
-

Explanations of abbreviations

- **In Winter:**
- AQ : Index for Air Quality
- ME : Index for Morning Exercises
- SK : Index for SKating
- CH : Index for CHilling
- SU : Index for SUNshining
- WC : Index for Wearing Clothes
- CL : Index for CLimbing
- MD : Index for MeDecine
- WS : Index for Winter Swimming
- CN : Index for Client Numbers who are shopping in a market
- RB : Index for Rowing Boat
- WA : Index for Washing car
- AN : Index for ANion
- CF : Index for Cement Freezing
-



4. Services for specialized sectors

4. Services for specialized sectors

Specialized sectors	Forecasts
Ocean. Meteor.	Global and coastal wind, fog, visibility, T.
Hydro-Meteor.	QPF, regional flooding
Transport Meteor.	U-V, SW, S. Temp., freezing
Environ. Meteor.	AQ, forest fire, geological disasters
Air Meteor.	Airport, flight lines, U-V, SW, T, RH
Pub. sanit. Meteor.	Healthy weather index

草原火险气象等级预报

(第 43 期)

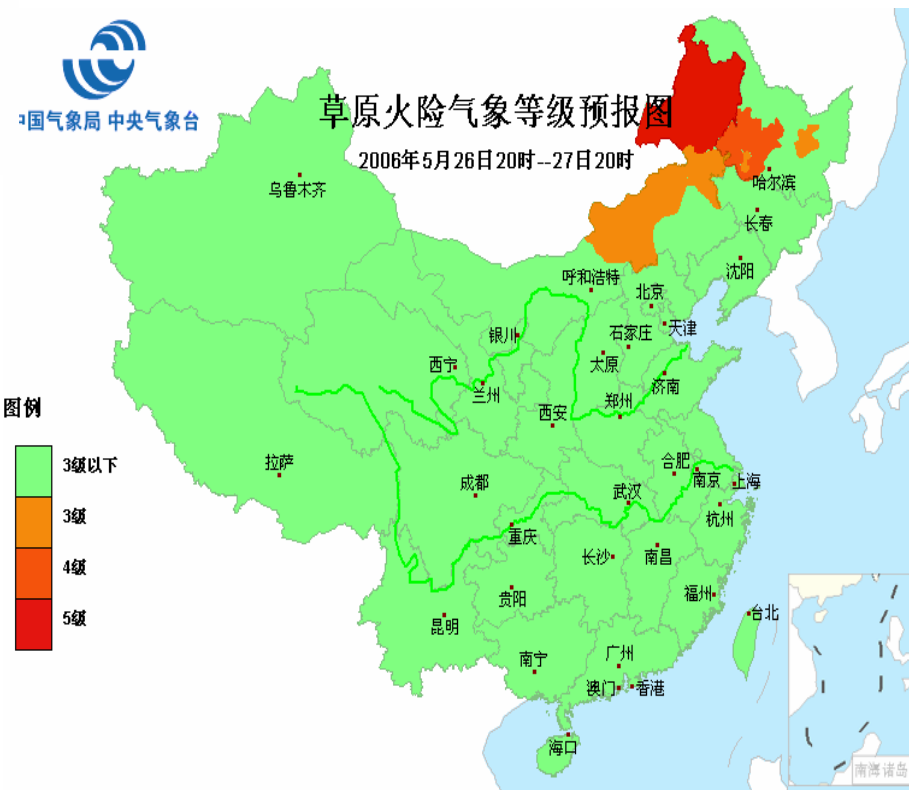
中央气象台

预报员: 阳瑞环 2006 年 5 月 26 日

中央气象台今天下午 6 点钟发布草原火险气象警报:

预计,今天晚上到明天,内蒙古锡林郭勒盟、兴安盟,黑龙江佳木斯市、大庆市有较高草原火险气象等级;黑龙江齐齐哈尔市、绥化市有高草原火险气象等级;内蒙古呼伦贝尔市有极高草原火险气象等级。

请各有关单位严加防范,禁止野外用火,确保草原安全。



森林火险气象等级预报

中国气象局中央气象台 预报员： 千海青
 签发： 阳焜环 2006年5月26日上午

黑龙江、内蒙古东北部未来三天森林火险气象等级预报

预计，未来三天，由于受弱高压脊的影响，内蒙古东北部、黑龙江北部地区将无明显降水，气温较高，同时上述地区大部将伴有4~6级左右的西北或偏南大风。森林火险气象等级将维持高或极高水平。

黑龙江嫩江火区未来三天天气及森林火险气象等级预报

日期	天气	温度(℃)	风	森林火险气象等级
26日08时~27日08时	晴间多云	24~4	西北风4-5级	4-5级
27日08时~28日08时	晴间多云	26~5	偏西风转偏南风4-5级	4级
28日08时~29日08时	晴间多云	28~6	偏南风5-6级	4-5级

黑龙江松岭火区未来三天天气及森林火险气象等级预报

日期	天气	温度(℃)	风	森林火险气象等级
26日08时~27日08时	晴间多云	23~3	西北风4-5级	4-5级
27日08时~28日08时	晴间多云	24~3	偏西风转偏南风4-5级	4级
28日08时~29日08时	晴间多云	25~4	偏南风5-6级	4-5级

内蒙古牙克石火区未来三天天气及森林火险气象等级预报

日期	天气	温度(℃)	风	森林火险气象等级
26日08时~27日08时	晴间多云	20~3	偏西风4-5级	4级
27日08时~28日08时	晴间多云	20~3	偏西风转偏南风4-5级	4级
28日08时~29日08时	晴间多云	23~4	偏南风5-6级	4-5级

重大气象信息专报

Summarized services

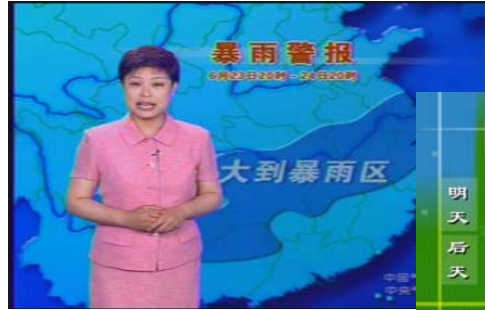
台风				
暴雨				
高温				
寒潮				
大雪				
雷雨大风				
大风				
沙尘暴				
冰雹				
雷灾				
道路结冰				

重要天气公报

中国气象局中央气象台 2006年10月15日

华北东北地区将出现风雨和降温天气

来自西伯利亚的一股冷空气今天上午其前锋已到达我国新疆北部地区，预计这股冷空气将继续向东移动，未



北京

明天 10~17°C

后天 5~10°C

紫外线强度 弱

污染指数 101-121

空气质量 轻度污染

主要城市天气播报

天气公报

预报员：何立富 2006年5月16日下午



新闻通稿

中国气象局中央气象台 2006年10月16日 11时

● 强冷空气影响我国大部分地区

秋季是我国大部分地区降水最少的季节。近一周以来，华北平原大部、江淮、江汉流域、西南地区东部、江南以及华南大部地区旱情出现了缓解。其中湖南、湖北、浙江、江苏、安徽、河南、河北等地旱情都出现了较长时间以来未见的缓解。对公路交通运输、航运和人的健康造成不利影响。部分地区在上午8时以后逐步缓解。预计今后几天里，华北平原南部、江汉流域、江淮、江南中东部、华南大部仍将受旱。我国部分地区受旱。

受形成的主要原因：(1) 我国东部在前期盛行偏东气流，这种气流和为偏南，造成有利的条件；(2) 最近无明显的冷空气影响我国大部分地区，大部分地区大气层结为稳定，空气透明度高，利于辐射降温，导致近期旱情加剧，使水汽难以凝结成云形成降水。

● “高力”中转为强冷空气

今年夏秋季节，我国大部分地区降水偏少，对秋收不利。

● 强冷空气影响我国大部分地区

今年夏秋季节，我国大部分地区降水偏少，对秋收不利。



2006年9月28日至30日 峰地区天气预报

一、未来三天天气预报

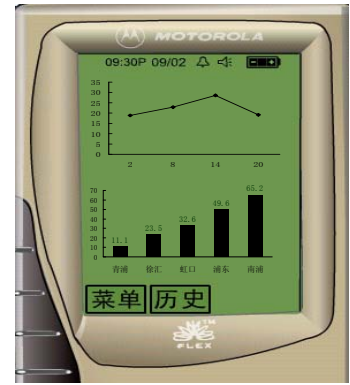
日期	天气	最高气温	最低气温	风向	风速
28日	多云	11	5.8	3	偏东风 4~6
29日	多云	15	5.5	4	偏东风 4~6
30日	多云	14	5.2	4	偏东风 4~6
31日	阵雨	14	5.2	4	偏东风 4~6

二、夜间时段最低气温预报

日期	海拔高度	最低气温	最低气温	风向	风速
28日	5000米	-5	-23	-7	偏东风 6~8
29日	5000米	-17	1.4	-19	-2.0
30日	5000米	-5	-23	-7	偏东风 6~8
31日	5000米	-17	1.4	-19	-2.0
30日	5000米	-8	-21.0	-8	偏东风 6~8
31日	5000米	-17	1.4	-19	-2.0



Summarized services



谢谢!

Thanks!